

EXERCISE WEIGHT SYSTEM

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application claims priority from related U.S. Provisional Patent
5 Application Serial No. 60/417,451, filed October 10, 2002, the entire disclosure of
which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

1) Field of the Invention

10 The present invention relates generally to exercise devices, and in
particular to devices used for weight training and weight lifting, such as
dumbbells, barbells, and their respective storage racks.

2) Description of Related Art

15 Dumbbells and barbells are inertial force exercise devices with dense
body extremities. They comprise of a central handle bar for gripping the devices,
with weight heads or plates attached at or near either end of the bar. In general,
the heads may comprise of removable circular weight plates so that different or
additional weight heads may be attached as desired to vary the weight of the
20 device. Dumbbells and barbells with non-removable weight heads or plates
comprise of circular weight plates permanently attached to their central handle
bar.

In either case (removable or non-removable weight plates), when a user wants to change the amount of weight used for exercise, the user must switch to another higher or lower weight dumbbell with permanently attached weights or
5 change the removable weight plates coupled thereto. This usually requires the user to return the dumbbell to an equipment storage rack to select another dumbbell or weight plates of higher or lower weight. Inherent to most weight training equipment is the fact that they are bulky, difficult to balance and control, and dangerous to handle as the amount of weight increases since users handling
10 them can easily lose control and drop the devices, especially when they have exercised for a while and are fatigued.

Dumbbells and barbells are therefore often used in a rough manner, and commonly dropped or banged against the storage racks, damaging their plates
15 and the storage rack. Currently, round plate dumbbells are stored on racks comprised of concave plastic lune or crescent shaped saddles supported by long flat trays. In general, the sizes and the spacing of each saddle are configured in accordance with the largest head plate of a dumbbell that the saddles must accommodate. This way, regardless of the size of the dumbbell plates, the
20 dumbbell can be stored on any saddle positioned anywhere along the rack tray. This method of storage is not space efficient because saddles must be evenly spaced on the tray rack, and each saddle must have the same bulky size. A

further, more fundamental disadvantage inherent in such a storage method is the use of the dumbbell head or weight plates for the storage. Rough handling the dumbbells by dropping them may damage the rack saddles and may damage the head or weight plates when they hit the rack tray.

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BRIEF SUMMARY OF THE INVENTION

The present invention uses an inertial force exercise device comprised of an ergonomically snug grip handle bar, racking collars on either side of the central handle, including head weight plates in combination with a storage
10 racking system that enables appropriate mating with the racking collars of the inertial force exercise device.

The racking collars are comprised of a circumferential groove that mate with a "U" shaped spaces or openings lined along the racking storage unit. The
15 users align one of the grooves of the inertial force exercise device with a slot along the rack faceplates to store the device thereon. The weight plates or dense body extremities of the inertial force exercise device do not contact the racks. The grooves on the exercise device isolate the weight plate's outer surfaces from physically contacting the storage rack. The storage system is also
20 space efficient because the "U" shaped storage spaces or slots along the racks take less space, and no longer need to accommodate the largest weight plates of

an exercise device; they function as mortises to accommodate a smaller sized groove on a side of the inertial force exercise device.

These and other features, aspects, and advantages of the invention will be
5 apparent to those skilled in the art from the following detailed description of preferred non-limiting embodiments, taken together with the drawings and the claims that follow.

BRIEF DESCRIPTION OF THE DRAWINGS

10 It is to be understood that the drawings are to be used for the purposes of exemplary illustration only and not as a definition of the limits of the invention.

Referring to the drawings in which like reference numbers present corresponding parts throughout:

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Fig. 1A is an exemplary front view illustration of an inertial force exercise device in accordance with the present invention;

Fig. 1B is an exemplary cross-sectional view along a vertical axis of the
20 handle of the inertial force exercise device of Fig. 1A, illustrating its gripping recessed grooves in accordance with the present invention;

Fig. 1C is an exemplary cross-sectional view along the axis or shaft of the inertial force exercise device of Fig. 1A in accordance with the present invention;

Fig. 2 is an exemplary perspective view of the combined inertial force exercise device of Fig. 1A to 1C and a storage unit therefor in accordance with the present invention;

Fig. 3 is an exemplary side view of the combined inertial force exercise device of Fig. 1A to 1C and a storage unit therefor in accordance with the present invention;

Fig. 4 is an exemplary perspective view of the combined inertial force exercise device of Fig. 1A to 1C and a storage unit therefor, with the device of Fig. 1A to 1C stored on the storage unit in accordance with the present invention;

Fig. 5 is an exemplary side view of the combined inertial force exercise device of Fig. 1A to 1C and a storage unit therefor, with the device of Fig. 1A to 1C stored on the storage unit in accordance with the present invention;

Fig. 6 is an exemplary top view of the combined inertial force exercise device of Fig. 1A to 1C and a storage unit therefor, with the device of Fig. 1A to 1C stored on the storage unit in accordance with the present invention;

Fig. 7 is an exemplary perspective illustration of a storage unit for the exercise device of Fig. 1A to 1C in accordance with the present invention;

5 Fig. 8 is an exemplary side view of the storage unit illustrated in Fig. 7 in accordance with the present invention.

DETAIL DESCRIPTION OF THE INVENTION

Fig. 1 is an exemplary illustration of an inertial force exercise device 1 with
10 dense body extremities 2 and 16 in accordance with the present invention. As illustrated, the exercise device 1 comprises of an approximately cylindrical ergonomic snug grip handle bar 40. The handle 40 comprises a middle portion 36 and two edge grip end portions 8 and 10 that are contiguous with and uniformly integral part of the middle portion 36. The diameter of the middle
15 portion 36 at section 30, moving towards the proximal ends of the two edge grip portions 8 and 10, at sections 28 and 32, respectively, gradually decreases. Thereafter, beyond the proximal sections 28 and 32, the diameter of the handle 40 increases at the distal ends of the portions 8 and 10 as illustrated. The diameters of the two distal ends of the portions 8 and 10 are graduated to meet
20 at near the top of the respective collars 22 and 24 of the device 1.

This innovative construction method for the handle 40 requires minimum amount of handle length to achieve a secure grip. The larger diameter section indicated by the dashed line 30 of the middle portion 36 of handle 40 occupies or fills-in the incurvate section of the palm when users curl their hand to grip the handle 40. The grip is further secured by the gripping recessed grooves 41 on handle 40 along the axis 46 of the exercise device 1. The vertical cross-sectional view along the dashed line 30 of recessed grooves 41 are better illustrated in Fig. 1B. As the user's hand firmly grip the handle 40, the skin of their fingers and hands is pressed within and fill-in the grooves 41, creating friction for better secure grip.

Referring back to Fig. 1A, the two distal edge grips 8 and 10 raised to the top of the respective collars 22 and 24 snug the two outer edges of the hand to prevent the exercise device 1 from sliding along the indicated axis 46. When gripping the exercise device 1, the virtual axis running through a curled hand parallels axis 46 of the device 1. During exercise, the movement and the weight of the device 1 creates a momentum that forces it to move within the hand along this axis. Repeated movement of the device 1 by extending and closing the arms when it is held in parallel to the user body with the axis 46 perpendicular to the ground helps develop, amongst others, the biceps and brachioradialis muscles. The fatigue from the intensity of the exercise may compel users to loosen their grip on the device 1, and the perspiration from their hands due to the intense

exercise acts as a lubricant, both of which dangerously exasperate the movement of device 1 along the axis 46. The two edge grips 8 and 10 act as "stops", terminating the sliding of the device along this axis, while the larger diameter section 30 of the handle 40 provides for a snug or tight grip of the device 1.

The approximately cylindrical ergonomic snug grip handle bar 40 is further connected at either ends to reel like structures 42 and 44, which comprise of cylinders 6 and 12, respectively, with respective collars 22 and 24 forming one base or wider part of the reels 42 and 44, and the respective inside faces 4 and 14 of each dense extremity 2 and 16 the other base or wider part. The circumferential grooves 20 and 26 formed by the respective reel like structures 42 and 44 enable cantilever storage of the inertial force exercise device 1 on a commensurate storage unit (shown in Figs. 2 and 3). If permanently attached, the dense extremities 2 and 16 may be hydraulically pressed onto the handle 40, using an internal crush-cone to permanently secure all components for use. Fig. 1C is an exemplary cross-sectional view along the axis 46 showing shaft or bar 7 of the inertial force exercise device 1 of Fig. 1A in accordance with the present invention. The shaft or bar 7 is permanently secured to the two extremities 2 and 16 through respective cylinders 6 and 12. This figure also illustrates the surface profile of the ergonomic handle.

As illustrated in both Figs. 2 and 3, each exercise device 1 uses one of the circumferential grooves 20 or 26 to mate with a corresponding slot 50 in a rack faceplate 54 for cantilever storage of the devices 1. The storage unit or rack 52
5 comprises of a plurality of faceplates 54 having slots 50 lined along its frame length. Each slot 50 comprises of a concave "U" shaped groove at its lower portion 56, and is open at the top, with outwardly beveled or slanted edges 58 at near the top thereof. The slots 50 form as cavities into which one of the circumferential grooves 20 or 26 fits when storing the device 1. This fixes device
10 1 at one extremity (20 or 26) and free at the other. Each slot 50 may also advantageously have a cover 62 to protect both the edges of the slot 50 and the circumferential grooves 20 or 26 of device 1 from abrasion or other damage during storage or removal of device 1.

15 As illustrated in Figs. 4 to 6, at inserted (or stored) position, the slots 50 act like mortises into which one of the grooves 20 or 26 of the device 1 rests. The support for maintaining the inertial force exercise device 1 within the slot 50 is achieved by an inside face wall 4 or 14 of device 1 juxtaposed against the outside wall of the cover 62, with the cylinder 6 or 12 of device 1 resting on the
20 lower "U" shaped portion 56 of the slot 50 and the collar 22 or 24 of device 1 abutting the inside wall of the cover 62. This allows for cantilever storage of the device 1 where one side is fixed (stored) and the other side of the device is free.

Rack faceplates 54 may be fixed or mounted on walls or other structures to form a complete storage unit 52. Figs. 7 and 8 illustrate an exemplary stand-alone version of a storage unit 52 having two rack faceplates 54 attached to two exemplary frames stands 70 and 72. In this exemplary illustration, the distal ends of the rack faceplates 54 are coupled to the rigid frame stands 70 and 72 by fasteners (not shown) through corresponding apertures 60 located on both the rack faceplates 54 and each of the stands 70 and 72. As illustrated in Fig. 8, in general, regardless of where the rack faceplates 54 are mounted, it is preferred that they be positioned at approximately 15 degrees off vertical to accommodate a natural and ergonomic positioning of the exercise device 1. This racking method allows for the ergonomic and space efficient racking arrangement, while safely storing the inertial force exercise device 1 for future use. The exercise device 1 and the rack faceplates 54 are space efficient because slots 50 do not have to comprise of sizes that accommodate the largest dense extremities 2 and 16 of the device 1. In fact, the system does not depend on the dense extremities 2 or 16 for the storage of device 1. The system uses a groove 20 or 26 to "hang" the inertial exercise device 1 without the outer surfaces of its dense extremities 2 and 16 touching the storage unit. Accordingly, this circumferential cantilever system prevents damage to any visible surface of the inertial force exercise device 1 because they do not contact the rack during removal or insertion.

While illustrative embodiments of the invention have been described, numerous variations and alternative embodiments will occur to those skilled in the art. For example, the inertial force exercise device 1 may comprise of dumbbells or barbells. The two dense extremities 2 and 16 may comprise of
5 removable weight plates so that different or additional weight plates may be attached as desired to vary the weight of the device. They may also comprise of non-removable weight plates permanently attached to the central handle bar of the device 1. Although illustrated as circular, the two dense extremities 2 and 16 may comprise of any shape, size, and weight appropriate for exercise. The
10 shapes may include, but not be limited to, any four sided or polygon shape dense extremities or weight plates. The collars and the circumferential grooves of the inertial force exercise device 1 could also be formed of any shape and size. In addition, although two symmetrical storage collars 22 and 24, and grooves 20 and 26 are illustrated and described, a single collar and groove may be used on
15 only one side of the device 1 with the other "filled-in" having no groove or channel. As to the storage units, it is possible to use a variety of different fastening methods to attached faceplate 54 to supporting structures or to other faceplates 54. Two or more faceplates 54 may be attached to one another at any appropriate angles at their distal ends to form a triangle, a rectangle, or a
20 polygon, all supported by a frame structure. Such variations and alternate embodiments are contemplated, and can be made without departing from the spirit and scope of the invention.